

**Notice of Allowability**

Application No.

10/525,268

Examiner

Henry S. Hu

Applicant(s)

POPPE ET AL.

Art Unit

1713

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment of September 7, 2006.
2. ☒ The allowed claim(s) is/are 1-25,30 and 31.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in two telephone interviews with **Anna M. Budde (registration # 35,085, tel: 248 641-1600) on September 22 and 27-28, 2006** to cancel all non-elected Claims 26-29 and 32 as following:

#### Claim

**Claims 26-29 and 32** please cancel Claim 26, Claim 27, Claim 28, Claim 29, and Claim 32

### DETAILED ACTION

2. This Office Action is in response to **Amendment** filed on September 7, 2006. With such an amendment, **Claims 15, 21 and 30 were amended**, while no claim was cancelled or added. To be more specific, Claims 15 and 21 were amended to correct the informalities raised in claim objections, while Claim 30 was amended to correct a typographical error. Applicants

Art Unit: 1713

have provided the clarified statements on page 13 of Remarks regarding the wording of "near-completely" and the language of "...with (A), (B), and (C)". Examiner thereby withdraws 112-2<sup>nd</sup> claim rejection, specification objection (on abstract), and claim objections in the previous Non-Final Office Action dated June 23, 2006.

With the above examiner's amendment, all non-elected claims including **Claims 26-29** (a dispersion from original Group III) **and Claim 32** (also relates to a dispersion; it is thereby rejoined with Group III under new restriction requirement on interview of September 27-28, 2006 with attorney Anna M. Budde) were cancelled. **Claims 1-25 and 30-31** with only one independent claim (**Claim 1**) are now pending. An action follows.

3. Claim rejections under 35 USC 102 and 103 rejections in previous **Non-Final** Office Action filed on June 23, 2006 are now removed for the reasons given in paragraphs 4-9 hereinafter.

***Allowable Subject Matter***

4. Claims 1-25 and 30-31 are allowed.

5. The following is an examiner's statement of reasons for allowance: The above claims 1-25 and 30-31 are allowed over the closest references:

Art Unit: 1713

6. The limitation of parent **Claim 1** in present invention relates to surface-modified nanoparticles whose surface is "covered" completely or near-completely with:

(A) modifying groups which are attached covalently to the surface via at least one linking functional group (a) and contain at least one inert spacer group (b) and contain at least one reactive functional group (c) which is connected via the group (b) to the group (a) and is inert toward the reactive functional groups of the surface to be modified,

(B) modifying groups which are attached covalently to the surface via at least one linking functional group (a) and contain at least one inert group (d) attached to the surface via group (a) having a smaller hydrodynamic volume  $V_H$  than the inert spacer group (Ab), and

(C) modifying groups which are attached covalently to the surface via at least one linking functional group (a) which contains at least one silicon atom, contain at least one inert group (e) attached to the surface via group (a), and have a smaller hydrodynamic volume  $V_H$  than the modifying group (A).

See other limitations of dependent **Claims 2-25 and 30-31**.

7. Applicants have now claimed in parent **Claim 1** an unexpected way of **obtaining surface-modified nanoparticles** whose surface is "covered" completely or near-completely with a combination of all the claimed three modifying groups. In responding to Examiner's 112-2<sup>nd</sup> claim rejections filed on June 23, 2006, Applicants have already provided the clarified statements on page 13 of Remarks regarding the wording of "near-completely" and the language of "...with (A), (B), and (C)". Attention is directed (by Applicants) to the

Art Unit: 1713

disclosure in paragraph # 0040 as **“the surface of the nanoparticles of this invention are covered with at least three, in particular three, different classes of modifying groups”**.

8. In a very close examination, all the three involving references including **Lesniak, Adams and Groth**, in combination or alone, cannot teach such a surface modification on nanoparticles as following:

Firstly, Lesniak discloses **using only a combination of two modifying groups (A) and (C) but not modifying group (B)** as pointed out by Applicants (see page **14** of Remarks).

9. Secondly, Adams is **at least missing modifying group (C)** as pointed out by Applicants (see page **15** of Remarks).

Thirdly, secondary reference Groth only discloses using a crosslinker in making coating films so as to cover the silent four or five things by primary reference Lesniak or Adams. As pointed out by Applicants, Groth does not even mention or suggest using modifying group (B) (see page **16** of Remarks). In summary, Groth cannot fix the deficiency of Lasniak or Adams.

10. It is a fact that using a combination of three different modifying groups to modify the surface of nanoparticles is rare. The surface properties obtained from such a modification with a combination of three modifying groups will certainly at least somewhat different from using just one or two modifying groups.

In a close examination of three references cited as X in the international **search report for Applicants' PCT/EP03/10922 (WO 2004/035649 A1 to Poppe et al.**, the examiner at least confirms that **all of three** fail to teach or fairly suggest the preparation of such a surface modifying with a combination of three claimed modifying groups on nanoparticles in current application. Same or similar rationale mentioned in above paragraphs can be applied here.

11. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

US Patent No. 6,444,143 B2 to Bawendi et al. disclose the preparation of water-soluble fluorescent nanocrystals by attaching a modifier containing a hydrophilic group, a linking group and a hydrophobic group (abstract, line 1-15; see all figures; column 3, line 27-33). The linking group may include compounds having **lone electronic pairs** available for interaction with the semiconductor surface, such as from oxygen, sulfur, nitrogen and phosphorus (column 7, line 56-67). **It is thereby NOT covalently bonded** to the surface of nanoparticles. Additionally, **all three claimed modifying groups -(A), (B), and (C)- are NOT used together**. Therefore, Bawendi fails to teach or fairly suggest the limitation of present invention.

12. The key issues on using all three modifying groups -(A), (B), and (C)- in covering nanoparticles completely or near-completely, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

Art Unit: 1713

13. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the independent and parent **Claim 1** is allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 2-25 and 30-31** are passed to issue.

14. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

15. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

Art Unit: 1713

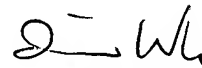
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

September 28, 2006



DAVID W. WU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700